Date: Mon, 16 May 94 18:33:27 PDT
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>
Errors-To: Info-Hams-Errors@UCSD.Edu
Reply-To: Info-Hams@UCSD.Edu
Precedence: Bulk
Subject: Info-Hams Digest V94 #534
To: Info-Hams

Info-Hams Digest Mon, 16 May 94 Volume 94 : Issue 534

Today's Topics:

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: 16 May 1994 20:18:10 GMT
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!convex!news.duke.edu!concert!
inxs.concert.net!taco.cc.ncsu.edu!salavi@network.ucsd.edu
Subject: ?? Need help with an external short wave radio antenna ??
To: info-hams@ucsd.edu

I need to gather some info on building an antenna for short
wave reception? Please excuse my ignorance, I am very new at
this. Someone told me that All I need to do is connect a very
long thin wire from an adjacent tree to the house and one from
the ground and connect them into the adapter that goes into the
external antenna plug. I have some questions:

1) How long should this wire be? Is it somehow related to the
frequencies that I am interested in? What if I am interested in
more than one?

2) should the wire be shilded or unshielded?

3) what should be the gauge of the wire? The thicker the better?

4) should the wire be the meshed type or a single thread?

>>> Please include this message for reference <<<
====== S. Alavi [salavi@unity.ncsu.edu] (919)467-7909 (H) ========
(919)856-3817 (W)

Date: Mon, 16 May 1994 16:40:11 -0400
From: udel!ssnet.com!hal.spasci.com!dave@cs.rochester.edu
Subject: A GEnie test
To: info-hams@ucsd.edu

Just trying to see if this stuff is actually leaving GEnie. WA2VCI WB2BFB.

Date: Sun, 15 May 1994 21:57:21 MDT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!math.ohio-state.edu!
cyber2.cyberstore.ca!nntp.cs.ubc.ca!alberta!ve6mgs!usenet@network.ucsd.edu
Subject: ARLP019 Propagation de KT7H
To: info-hams@ucsd.edu

SB PROP @ ARL $ARLP019
ARLP019 Propagation de KT7H

ZCZC AP33
QST de W1AW
Propagation Forecast Bulletin 19 ARLP019
>From Tad Cook, KT7H
Seattle, WA May 13, 1994
To all radio amateurs

SB PROP ARL ARLP019
ARLP019 Propagation de KT7H

Solar activity has been very low, with geomagnetic conditions from unsettled to active. Solar flux bottomed out at 73, and is now climbing toward a probable peak around 105 centered on May 25 or 26. Look for conditions to remain unsettled, with recurring coronal holes returning to produce stormy conditions again after May 28.

For the CQ-M Contest this weekend look for moderately unsettled conditions, with flux around 85.

Sunspot Numbers from May 5 through 11 were 15, 45, 34, 44, 16, 2 and 38, with a mean of 31.2. 10.7 cm flux was 73, 74, 73.8, 74.4, 77.3, 80 and 81.9, with a mean of 76.3.

The path projection for this week is from Benton, Kentucky, near Paducha, to Ukraine.

80 meters should be open briefly around 0130z. Check 40 meters from 0030 to 0330, and 30 meters from 2300 to 0430. 20 meters should be best from 2000 to 2300. 17 meters does not look promising, but on some days a check around 2000 to 2130 may prove fruitful. 10, 12 and 15 meters do not look good at this time.
NNNN
/EX

Date: 16 May 1994 20:05:23 GMT
From: tymix.Tymnet.COM!niagara!flanagan@uunet.uu.net
Subject: FD Generator
To: info-hams@ucsd.edu

This may not be the best newsgroup for this, but I'm sure I'll be told where to go if it's not. :-)

I am about to purchase a gasoline-powered AC generator for Field Day (and similar) uses. I went to the local Supply One (super hardware store) and they had Coleman, Yamaha and Makita generators. The price of 5KW units varied from $500 to $1500. Interestingly enough, there were no Hondas in sight, even though I've seen more of them in the field than just about any other kind.

My question is, for FD use, with no need for fancy stuff like autostart or load switching, what is the preferred brand of AC generator? Where does one go for the best deal on one?

Thanks for any and all help.

73, Dick

--
Dick Flanagan, W6OLD w6old@n6qmy.#nocal.ca.usa.na
dick@libelle.com CIS:73672,751 GEnie:FLANAGAN

Date: 16 May 94 19:13:47 GMT
From: agate!howland.reston.ans.net!news.intercon.com!news1.digex.net!access1!
ronald@ucbvax.berkeley.edu
Subject: Final QTH Monument
To: info-hams@ucsd.edu

Tired of those old fashioned headstones? Want something special for your final resting place? What to take your call sign with you? How about a Marble HAM Headstone with your call sign tastefully engraved; possibility exists to have that antenna you always wanted but never could erect etched permanently along with your call sign on the same headstone. Antennas to scale. A special chip is available to emit your call sign and a CQ on the date of your demise, or date you were first licensed. If you are within several years of occupying your final resting please consider a HAM Headstone. If you should upgrade prior to death there will be an extra charge for reconfiguration. Remember you can take it all with you. Replies by E Mail. Advance payment in full required. Special discount for Ham couples (K4ADL take note) who will be residing together permanently.

Date: Mon, 16 May 1994 19:50:34 GMT
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!convex!darwin.sura.net!coil!
emerald.nist.gov!proctor@network.ucsd.edu
Subject: HTX-202 problem
To: info-hams@ucsd.edu

Hello,

I have a problem with my RS HTX-202 which I think is related to the power save feature. I set the time-slice for the power saver to 1/4 sec and turned on "SAVE". Since then, quite often, the receiver will turn on right in the middle of an ongoing qso. This happens even while listening to a local repeater which is S9+30 and the squelch is set just above the background noise (even an S1 signal will open the squelch). This has also happened while I was operating simplex. It appears that the receiver does not always "wake up" when a signal is present.

I have recently turned off the save feature, and the problem seems to have gone away, but I need more time to say that the problem is gone for sure.

Has anyone else had this problem? If it continues to work with save disabled,
I will send it back for repair.

73 - Jim

--
James E. Proctor | proctor@onyx.nist.gov | National Inst. of Stand. & Tech.
My opinions are my own. I have the receipt to prove it.
"Waiter, this food has snails in it!" - Lucy Ricardo in French Resturant
"I feel like roadkill on the Information Superhighway!" - Doug Marlette

---

Date: 16 May 94 19:15:10 GMT
From: agate!howland.reston.ans.net!cs.utexas.edu!convex!convex.com!
horak@ucbvax.berkeley.edu
Subject: HTX-202 problem
To: info-hams@ucsd.edu

In <940516145034@emerald.nist.gov> proctor@news-reader.nist.gov (James Proctor)
writes:

>I have a problem with my RS HTX-202 which I think is related to the
>power save feature. I set the time-slice for the power saver to 1/4 sec
>and turned on "SAVE". Since then, quite often, the receiver will turn on
>right in the middle of an ongoing qso. This happens even while listening
>to a local repeater which is S9+30 and the squelch is set just above the
>background noise (even an S1 signal will open the squelch). This has also
>happened while I was operating simplex. It appears that the receiver does
>not always "wake up" when a signal is present.

>I have recently turned off the save feature, and the problem seems to have
>gone away, but I need more time to say that the problem is gone for sure.

>Has anyone else had this problem? If it continues to work with save disabled,
>I will send it back for repair.

This *problem* is normal operation. The radio is asleep 3/4 of the time
so if a QSO starts up while the unit is asleep, you miss part of it. My
Alinco DJ560 does it too. It's normal. That's how the battery life is
extended. It's almost like the radio is off for those few moments the
radio is in battery save mode. Don't send the radio back for repair!
If a signal is present, it does not somehow *wake up* the radio. The
radio merely wakes up every so often to see if a signal is there. If it
is, it stays on; if not, it dozes off again.

David N5OFQ

Date: Mon, 16 May 1994 21:18:23 GMT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!europa.eng.gtefsd.com!
darwin.sura.net!coil!emerald.nist.gov!proctor@network.ucsd.edu
Subject: HTX-202 problem
To: info-hams@ucsd.edu

In article <horak.769115710@convex.com> horak@convex.com (David Horak) writes:

 -> In <940516145034@emerald.nist.gov> proctor@news-reader.nist.gov (James
Proctor) writes:
 ->
 -> >I have a problem with my RS HTX-202 which I think is related to the
 -> >power save feature. I set the time-slice for the power saver to 1/4 sec
 -> >and turned on "SAVE". Since then, quite often, the receiver will turn on
 -> >right in the middle of an ongoing qso. This happens even while listening
 -> >to a local repeater which is S9+30 and the squelch is set just above the
 -> >background noise (even an S1 signal will open the squelch). This has also
 -> >happened while I was operating simplex. It appears that the receiver does
 -> >not always "wake up" when a signal is present.
 ->
 -> >I have recently turned off the save feature, and the problem seems to have
 -> >gone away, but I need more time to say that the problem is gone for sure.
 ->
 -> >Has anyone else had this problem? If it continues to work with save disabled,
 -> >I will send it back for repair.
 ->
 -> This *problem* is normal operation. The radio is asleep 3/4 of the time
 -> so if a QSO starts up while the unit is asleep, you miss part of it. My
 -> Alinco DJ560 does it too. It's normal. That's how the battery life is
 -> extended. It's almost like the radio is off for those few moments the
 -> radio is in battery save mode. Don't send the radio back for repair!
 -> If a signal is present, it does not somehow *wake up* the radio. The
 -> radio merely wakes up every so often to see if a signal is there. If it
 -> is, it stays on; if not, it dozes off again.
 ->
 ->
 -> David N5OFQ

No, I'm not talking about missing the first 3/4 second of a qso. Please
give me a little bit of credit! :-) I'm talking about the receiver suddenly
turning on into a qso that has obviously been going on for some time (just
by the content of the conversation).

Another example, I was working a public service net a while back. The net
control station was no more than 100 yards from me, and the other stations

were no more than several hundred yards away. After 10 minutes of dead silence, I keyed the mic, gave a short report, and when I let go of the PTT, net control said, "Where have you been? I've called you about 6 times and so-and-so called you several times." I looked at the S-meter, and he was S9+30. The same thing happened later in the net. Once, just to see, I hit the PTT very quickly, and sure enough, the receiver turned on and someone else was in the middle of a transmission. I turned off the power save feature and have had no further such occurances.

73 - Jim
--
James E. Proctor | proctor@onyx.nist.gov | National Inst. of Stand. & Tech.
My opinions are my own. I have the receipt to prove it.
"Waiter, this food has snails in it!" - Lucy Ricardo in French Resturant
"I feel like roadkill on the Information Superhighway!" - Doug Marlette

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Date: Sun, 15 May 1994 01:15:57 GMT
From: news.Hawaii.Edu!uhunix3.uhcc.Hawaii.Edu!jherman@ames.arpa
Subject: Luck Hurder ... gone:(Why?
To: info-hams@ucsd.edu

In article <1994May11.131758.9021@cs.brown.edu> md@maxcy2.maxcy.brown.edu (Michael P. Deignan) writes:
>
>The League may claim to be a non-profit firm, but in fact it is a for-profit
>publishing house. The sooner people start to realize this they will be
>better off.

I thought `non-profit' meant that at the end of the year an organization's income and expenses were equal, i.e., they broke even.

>If you have any doubt, open any issue of QST and count the number of ARRL
>publications. Books, study materials, code tapes, license videotapes, the
>list is endless.

I wonder how much it costs to produce all the above. Do you want them to just give these items away free?

You've been in academics Mike so you certainly know how much textbooks cost today - now compare those costs to the prices the ARRL is charging for their books (their QRP NOTEBOOK: $5 - pretty cheap!).

>The League may be "non-profit" from the viewpoint of the IRS, but its
>certainly not non-profit from the viewpoint of the staff members who have
>made a career out of living off your membership fee to the League. Take a
>look over the years in the various issues of QST. Examine the names of the

>staff members. Look familiar? Seemingly never change? How many years has
>K1ZZ made a living off your membership dollars? Do you enjoy paying for his
>house, car, and vacation each year?

A non-profit organization's expenses include employee salaries. How those
employees spend their salaries is their own business.

I'm sure the taxpayers of the State of Hawaii (they pay my salary, and this
university is a non-profit corporation) don't mind that I've taken some of my
earnings and bought a sailboat to live on.

Jeff NH6IL

Date: 16 May 1994 18:46:32 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!
howland.reston.ans.net!vixen.cso.uiuc.edu!uxa.cso.uiuc.edu!
btbg1194@network.ucsd.edu
Subject: Man named Loomis invented radio?
To: info-hams@ucsd.edu

Newsgroups: uiuc.org.synton
Subject: Somebody named Loomis invented radio?
Date: 1 May 1994 02:01:51 GMT
Organization: University of Illinois at Urbana

I read something recently that a man named Loomis might have
"invented" radio in the late 1800's before Marconi & Hertz et al.

This might be an ancestor of the person for whom the University of
Illinois physics department "Loomis Lab" is named.

Does anybody else know more about this?

kb8cne, Brad

--
Brad Banko;   Univ of Illinois; b-banko@uiuc.edu
As much as our network and systems are loaded, the US Mail is often faster. :-)
See one. Do one. Teach one.   73 de kb8cne @ n9lnq.il
--
Brad Banko;   Univ of Illinois; b-banko@uiuc.edu
As much as our network and systems are loaded, the US Mail is often faster. :-)
See one. Do one. Teach one.   73 de kb8cne @ n9lnq.il

Date: 16 May 1994 19:49:58 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!
newsxfer.itd.umich.edu!zip.eecs.umich.edu!panix!ddsw1!news.cic.net!condor.ic.net!
iunet!geraldg@network.ucsd.edu
Subject: Radio Freq Wanted
To: info-hams@ucsd.edu

I am looking for the frequencies for NASCAR/ Winston Cup and BGN,
CART/Indy Car, and SCCA TransAm crew radios. Lists would be nice or
locations where I can grab them. Please E-mail me as I do not read this
group very often.
TIA
 --
____
Gerald Gillis   Michigan Automotive Research Corp
Email: geraldg@ic.net   -My opinions are my own * period-
       gerald.gillis@hal9k.com   bring back the HP-15C!!
_____________________________________Teach your children well___________

Date: Mon, 16 May 1994 20:30:28 GMT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!sol.ctr.columbia.edu!
news.ess.harris.com!news@network.ucsd.edu
Subject: repeater slang/lingo.
To: info-hams@ucsd.edu

In article <1994May12.224801.16556@newsgate.sps.mot.com>,
markm@bigfoot.sps.mot.com (Mark Monninger) says:
>
>In article <1994May12.160217.9245@rsg1.er.usgs.gov> bodoh@dgg.cr.usgs.gov (Tom
>Bodoh) writes:
>>
>> -> What's the story with the guys that end with 'Hi Hi' or is it just around
>> -> here?
>> ->
>HI is to CW what a smiley ;-) is to the net. Using it on voice modes is just
>another instance of CW'ism that have crept into voice users' vocabularies. I'm
>not sure when or where it originated. It's used here too. I can see using some
>Q signals on voice once in a while, but saying hi,hi instead of just laughing
>seems really dumb. Oh well...

Well, what I do on voice contacts is say, "colon close parenthesis" or sometimes
"semicolon dash close parentheses"   [hi h.........oops di di di dit di...no....
                                      ha ha ha... I'm so confused]

Harv
WB4NPL

Date: Sun, 15 May 1994 00:49:11 GMT
From: news.Hawaii.Edu!uhunix3.uhcc.Hawaii.Edu!jherman@ames.arpa
Subject: Willful Interference
To: info-hams@ucsd.edu

In article <Anthony_Pelliccio-100594102527@138.16.64.52>
Anthony_Pelliccio@brown.edu (Tony Pelliccio) writes:
>
>If our area is any indication, not much can be done with this guy. Several
>people have DF'd right to the source, a couple of people have obtained
>positive identification via spectrum analysis and guess what... local OO's
>will NOT write up a pink-slip. Then at the radio club meeting the issue was
>poo-poo'ed and bitched about. One thing for sure, this particular club is
>so steeped in red-tape it's not funny.

As long as your evidence is so solid why not go public? Send the details
to your local newspaper and see if they write up a story, or at least
send a letter to the editor. As long as you avoid direct accusations
and instead use phrases such as ``...our evidence shows that the
transmissions came from the residence of <whomever> at <whatever
address>...'' you shouldn't encounter any legal problems; detail how
the evidence was gathered, and mention the lack of action from the FCC.

At the very least let the offending operator know that you and many,
many, many others know (safety in numbers!) of his illegal operations;
maybe even send him a copy of Part 97 and list the dollar amounts of
the fines he could receive. Advise him that your findings have been
turned over to the federal government.

Others will say to avoid any contact with him but I've found that
direct contact is a big motivating factor in the cessation of these
kinds of activities.

Jeff NH6IL

Date: Mon, 16 May 1994 20:53:25 GMT
From: ihnp4.ucsd.edu!usc!elroy.jpl.nasa.gov!lll-winken.llnl.gov!fnnews.fnal.gov!
att-in!cbnewsc!k9jma@network.ucsd.edu
To: info-hams@ucsd.edu

References <2qddq5$lbg@hopper.acm.org>, <4ewwLc1w165w@voxbox.norden1.com>,
<1994May13.145055.1@ttd.teradyne.com>bne
Subject : Re: Was this a bad idea?

In article <1994May13.145055.1@ttd.teradyne.com> rice@ttd.teradyne.com (John Rice) writes:
>> smithson@ACM.ORG writes:
>>
>>> In article <2q9tks$npn@illuminati.io.com>, hoagy@illuminati.io.com (Sir Hoagy
>>> >
>>> >"This is unlicensed Matthew T. Rupert. I've got a bad accident
>>> > out here at <such and such>. Need ambulance and emergency response.
>>> > Will stand by and repeat"
>>> >
>>> >Since I was unlicensed, was it illegal for me to use my radio
>>> >on an amateur frequency for this situation?
>>> >
>>> It was technically illegal, but I do believe there are provisions in the law
>>> to accomodate 'good samaritan' actions.
>>
>> No, it was NOT technically illegal! The Communications Act
>> specifically states <paraphrased> that in the event of threats
>> to human health or safety or desctruction of property anything
>> reasonable goes.
>>
>
>Tell that to the Ham in California who had his equipment confiscated (with the
>tacit approval of the FCC) when he used a 2M HT on a Public Safety frequency
>to call in Emergency Medical assistance, after other methods of communications
>failed (ham, Cell Phone).
>
A similar case arises in aviation. The FAA rules say (paraphrased) that the pilot in command is the final authority as to the safe operation of the aircraft, and that the pilot in command my deviate from any rule to the extent necessary to meet an emergency. However, these statements don't operate to prevent enforcement of the same or other rules after the pilot has exercised this "authority" in case of an emergency. For example, it is a separate violation of a rule against "careless or reckless" operation to allow oneself to get into a situation where the emergency "authority" must be exercised.

So, there's a kind of Catch-22 situation in that the law or rule may say you can break other rules in some circumstances - but it doesn't say that the rule against breaking rules can't or won't be enforced.

Better not tempt the enforcers - unless it really will save _your_ life.
--
Ed Schaefer K9JMA ham radio N97178 aviation

Date: 16 May 94 21:20:24 GMT
From: agate!howland.reston.ans.net!cs.utexas.edu!geraldo.cc.utexas.edu!
portal.austin.ibm.com!awdprime.austin.ibm.com!blood@ucbvax.berkeley.edu
To: info-hams@ucsd.edu

References <1994May11.083458.812@pacs.sunbelt.net>,
<2qqt3k$bu@paperboy.gsfc.nasa.gov>,<CpnMEx.Kov@cbnewsc.cb.att.com>,
<1994May16.141525.863@pacs.sunbelt.net>
Subject : Re: HAM RADIO RUDENESS

Ive decided to quit saving for a HF rig after following this discussion.

Date: 16 May 1994 21:52:38 GMT
From: ihnp4.ucsd.edu!agate!kabuki.EECS.Berkeley.EDU!kennish@network.ucsd.edu
To: info-hams@ucsd.edu

References <linleyCpKosM.6qE@netcom.com>, <2r5r5c$qa5@crl2.crl.com>,
<Cpw8x7.2Ar@ryn.mro.dec.com>
Subject : Re: Best AA NiCads? (NiCd batteries in general)

People have written:
>>
>>The RS batteries can NOT be quick charged under any circumstances. I would
>>also consider the Millenium batteries. They are ordinary NiCa batteries, but
>>made to very high tolerance specs. They can be quick charged in Millenium's
>>charger in about 2.5 hours. The charger then keeps them trickle charged for
>>as long as you leave them in there. While they have the same AH rating as
>>most nicads, I find they last 30% to 40% longer then ordinary nicads in
>>LOW drain applications (like powering a scanner). They don't seem to do
>>better then others in high drain apps (transmitting for example), but then
>>they can be re-charged much faster. They are a bit more expensive, but I
>>would at least consider them. I've been using them for a couple of years
>>in my scanner, and they are great...

Hmm.....

I have yet to see a Ni-Cd battery that CANNOT be quick (1 hr)
charged. The issue is not charging, but overcharging. Batteries
differ greatly in their ability to withstand abuse due to
overcharge. I bet those RS cells can be quick charged in 1 hour,
but I wouldn't overcharge them one bit, since they would probably
vent or explode. Charge control is the key to battery management.

Let us review once again why Ni-Cd batteries behave this way. Ni-Cd
batteries take charging current very easily -- too easily for their

own good. Hence the need for constant current charging rather than constant voltage, as they would take too much current and destroy the charger or themselves due to the huge currents. There are other reasons for constant current which I will get to in a second.

The positive material is nickelic (Ni+3 or Ni+4) hydroxide when charged, and nickelous hydroxide when discharged (Ni+2). The negative plate is cadmium metal when charged and cadmium hydroxide when discharged.

As long as there is uncharged material left on the plates (i.e. nickelous hydroxide and/or cadmium hydroxide), the charging current goes to work and produces the nickelic hydroxide or cadmium metal as desired.

When the cell reaches full capacity, the charging current has to do some work. Since the plates are fully charged, the work goes to split water, a component of the electrolyte. Now, splitting water involves producing hydrogen and oxygen. This is bad, since this is explosive and keeping it in a sealed cell (even with vents) is NOT good. So, the battery manufactuers got smart....

The negative plate is bigger (electrochemically) than the positive electrode, and when manufactured, is slightly discharged. This means that the positive plate is reaches full charge first, and generates oxygen gas. This oxygen gas then migrates across the separator to the cadmium negative plate, and reduces it, forming cadmium hydroxide, which keeps the negative plate from reaching full charge. Under these conditions, the cell can remain on charge ad naseum. The bottleneck is the diffusion of the oxygen from the positive to the negative plate.

Under high currents, so much oxygen is produced at the positive plate that all of it cannot diffuse across to the negative plate. This is bad for several reasons. First, there is pressure build up. Second, since there is a limited amount of oxygen diffusing across, the amount of cadmium hydroxide being produced at the negative plate is limited. So, some of the current actually goes to convert the "excess" cadmium hydroxide to cadmium. When this happens, hydrogen is produced at the negative electrode. Pressure builds up and the cell vents. Once that happens, you are effectively losing water from the cell and the cell is permanently damaged. How badly depends on how much water you lose.

Battery manufacturers are doing all kinds of tricks to outsmart the average user to prevent him/her from killing their cells. Newer fast charge cells use activated carbon to act as an oxygen sponge to prevent high pressures from building up and to facilitate diffusion of oxygen to the negative electrode. The cost of this is that the carbon takes space, and that means less active material. So, for a given technology, rapid charge cells of this type will have

a lower Ah capacity than other cells.

Gas management is the key to withstanding overcharge. The better the ability to absorb the oxygen and deliver it to the negative plate, the more overcharge current it can handle. Of course, the generation and recombination of oxygen through the overcharge current creates heat, which is bad. You will note that Ni-Cd cells remain cool, even with high charge currents, and then quickly get hot as full charge is attained. If your cells are hot, then you have overcharged them -- slap yourself in the wrist.

In a quest to increase the Ah capacity of the cells, manufacturers are using sponge or foam electrodes. You get 20% more capacity out of these cells than regular sintered plate, but the cost is higher internal resistance. They do not perform well under high drain (i.e. transmitting) conditions. I believe that the Millenium cells are of this type. This would explain the apparent higher capacity under low drain conditions. The new Panasonic 900 mAh and the soon to be announced 950 mAh AA cell from Sanyo are of this type.

For best high drain performance, stick with the sintered plate. The capacity champ in this category is the Sanyo KR-800 AA cell, 800 mAh.

Stay away from hi-temp cells, unless you really have hi-temp, as the electrolyte is NaOH and has a higher resistance, again leading to poor high drain performance.

Memory effect:

Does it exist? YES.
Is it easy to reproduce? NO.

Whenever Ni-Cds don't perform up to snuff, the excuse is "memory effect."

Originally memory effect was seen in spacecraft batteries subjected to a repeated discharge/charge cycle that was a fixed percentage of total capacity. After many cycles, when called upon to provide the full capacity, the battery failed to do so.

Memory can be attributed to changes in the negative or cadmium plate. Recall that charging involves converting Cd(0H)2 to Cd metal. Ordinarily, and under moderate charging currents, the cadmium that is deposited is microcrystalline (i.e. very small crystals). Now, metallurgical thermodynamics states that grain boundaries are high energy regions, and given time, the tendency of metals is for the grains to coalesce and form larger crystals. This is bad for the battery since it makes the cadmium harder to dissolve to produce the discharge current. Hence you get "reduced capacity" or

more precisely, a voltage depression due to increased resistance.

The trick to avoiding memory is avoiding forming large crystal cadmium. Very slow charging is bad, as slow growth aids large crystal growth (recall growing rock candy). High temperatures are bad, since the nucleation and growth of crystals is exponentially driven by temperature. The problem is that given time, you will get growth of cadmium crystals, and thus, you need to reform the material.

This does NOT mean that you need to cycle your battery each time you use it. This does more harm than good, and unless you do it on a per cell basis, you risk reversing the cells and that really kills them. Perhaps once in a while, use your pack until it is 90% discharged, or do a cell voltage of 1.0V under light load. Here, about 95% of the cells capacity is used, and for all intensive purposes, is discharged. At this point, recharge it and that's it.

The more common "memory effect" isn't memory at all, but voltage depression caused by overcharging. Positive plate electrochemistry is very complicated, but overcharging changes the crystal structure of the nickelic hydroxide from beta-Nickelic Hydroxide to gamma-Nickelic hydroxide. The electrochemical potential of the gamma form is about 40 to 50 mV less than the beta form. This means that you get a lower discharge voltage. In a six cell (7.2v) pack, this means a loss of 300 mV. Trick? Don't overcharge. Leaving cells on a trickle charger encourages formation of gamma NiOH. Expect your cells to discharge at a lower voltage.

Summary:

DON'T deliberately discharge your batteries to avoid memory
DO let your cells discharge to 1.0V/cell on occasion through normal use.
DON'T leave your cells on tricke charge for long times, unless you can
    tolerate voltage depression.
DO protect your cells from high temperature both in charging and storage.
DON'T overcharge your cells. Use a good charging technique.
DO choose your cells wisely. Sponge/foam plates will not tolerate high
    discharge currents as well as sintered plate.

Take care of your cells, and they will take care of you. I have a set of cells from 1981 that are still working. Sintered plate, 450 mAh old technology -- rapid charged used a delta-V technique.

Contributing to the mythology of Ni-Cds,

Ken

p.s. NiMH cells can exhibit memory too, for much of the same reasons as above....(substitute hydride for cadmium). You will note less touting of memory-free operation of NiMH cells in the the future as more experience is gained.

End of Info-Hams Digest V94 #534
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